Securing the New IT Paradigms

Office of the CTO

May, 2018

Atos

Agenda

1. Who are Atos?
2. Sources of disruption
3. Moving to a Data Driven Digital Environment
4. Emerging Technologies Implications
   - Swarm, Blockchain, Quantum
5. Digital Transformation Case Study

1. Who Are Atos?

Who are Atos?

GLOBAL DIGITAL SERVICES LEADER that accelerates progress by uniting people, business and technology

€13bn
pro forma annual revenue

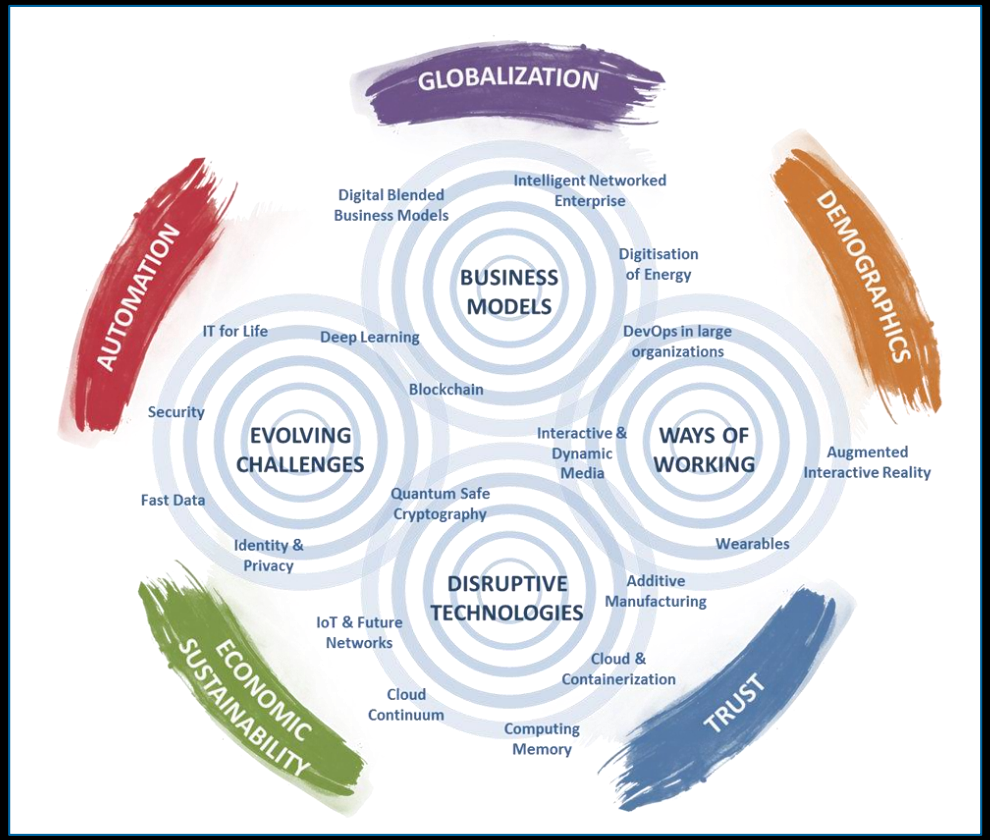
100,000
headcount

72
countries

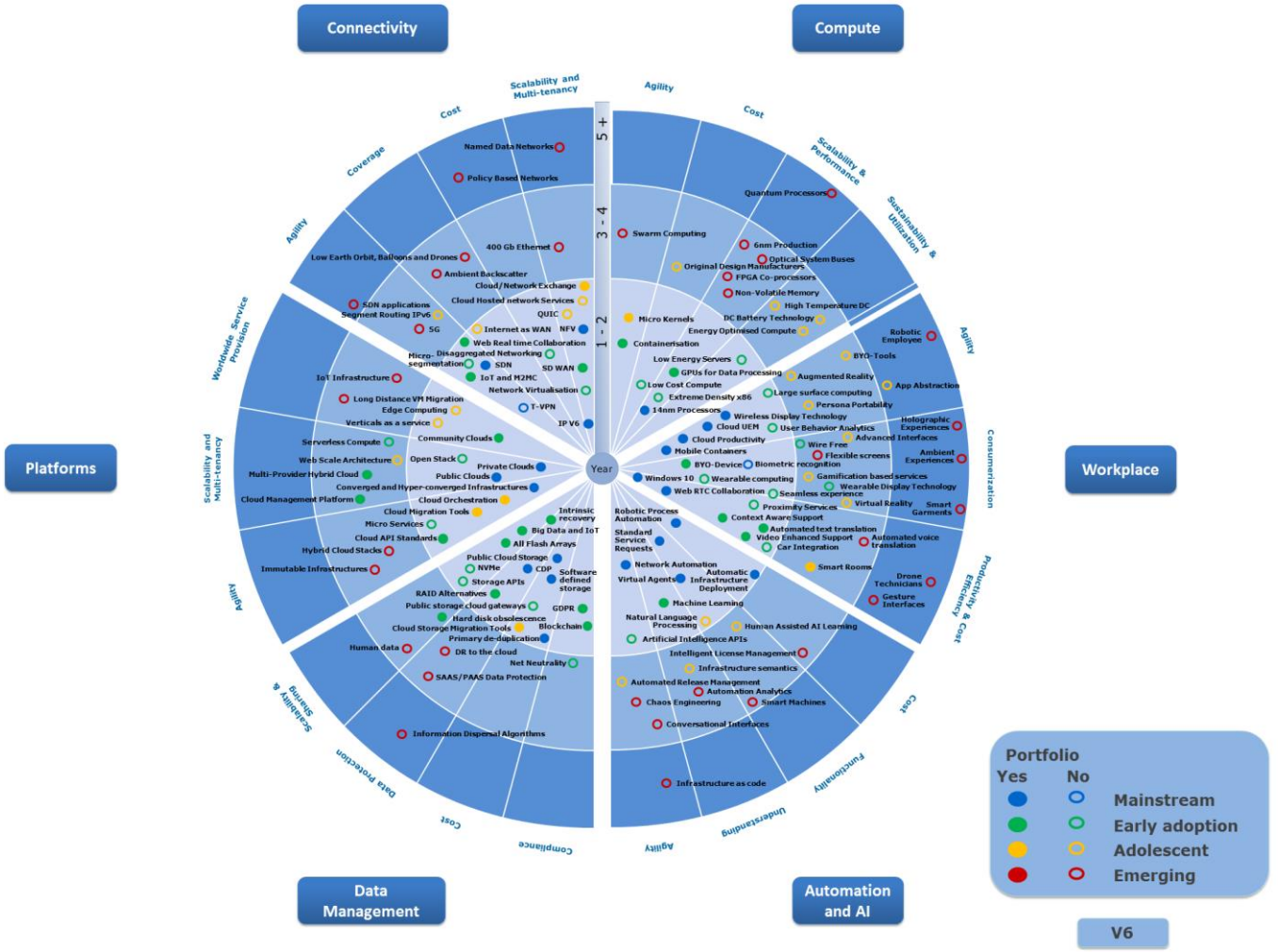
TRUSTED PARTNER FOR YOUR DIGITAL JOURNEY

2. Sources of Disruption

Journey 2020 Sources of Disruption



Plotting the Future



4. Moving to a Data Driven Digital Environment

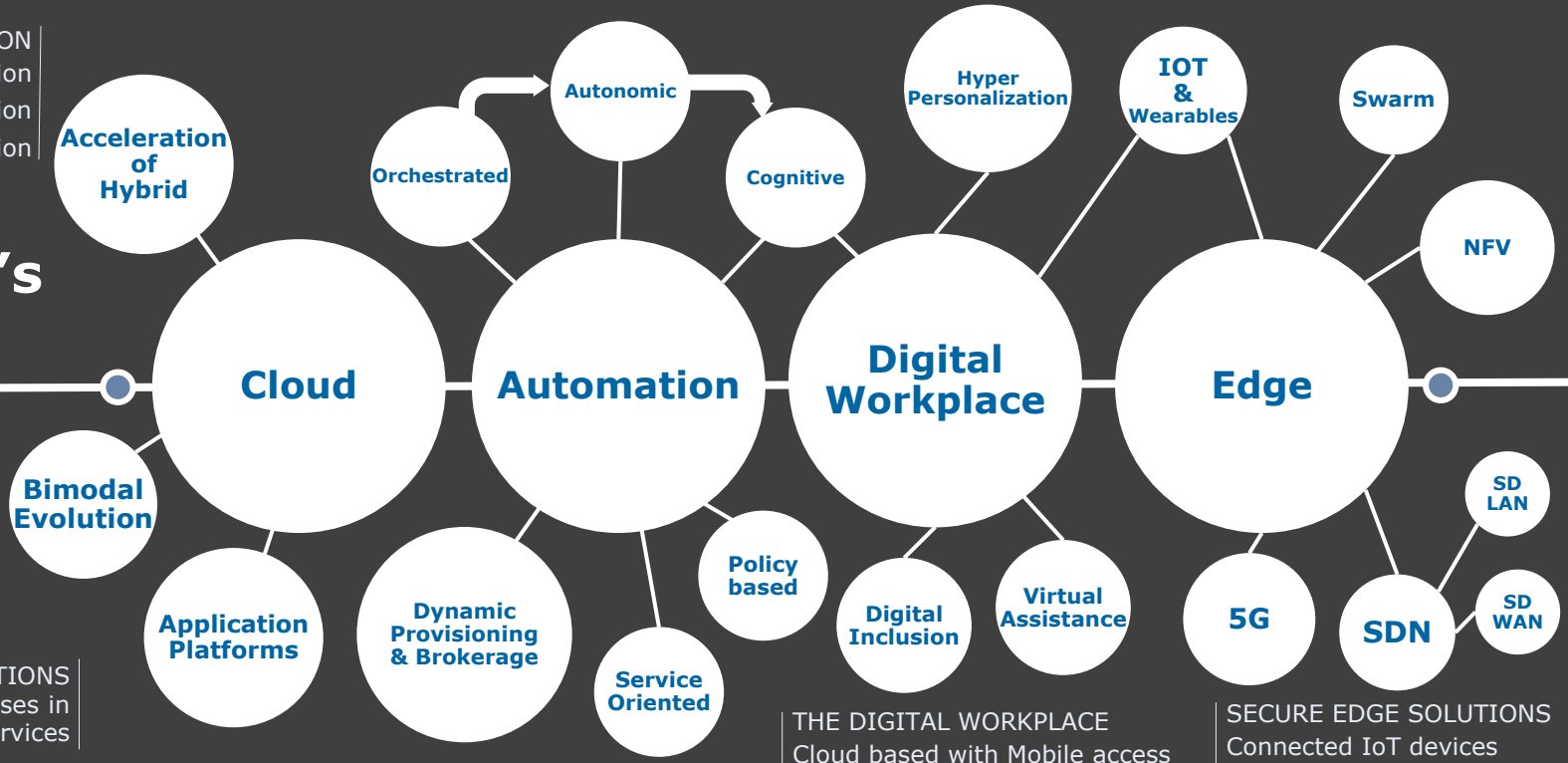
Moving to a Digital environment

Assuring the NOW, enabling the Future

BUSINESS REINVENTION
Business transformation through discovery, evaluation and realization

Tomorrow's Enterprise

Unlock the business value of a digital world



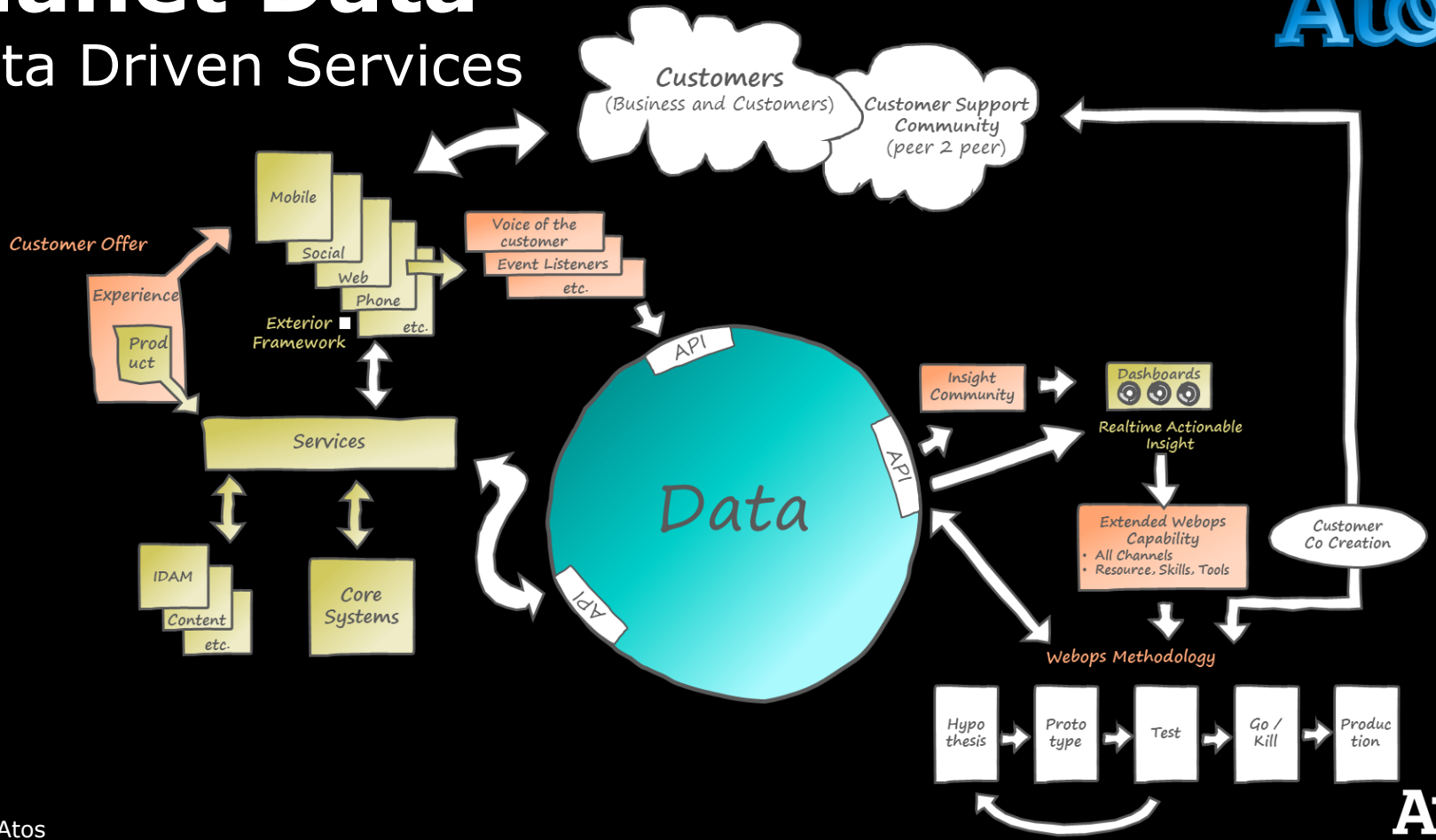
KEY APPLICATIONS
supporting enterprises in adopting digital services

THE DIGITAL WORKPLACE
Cloud based with Mobile access
Agile and personalised
Omnichannel support

SECURE EDGE SOLUTIONS
Connected IoT devices
Real-time Information
Context Sensitive Content

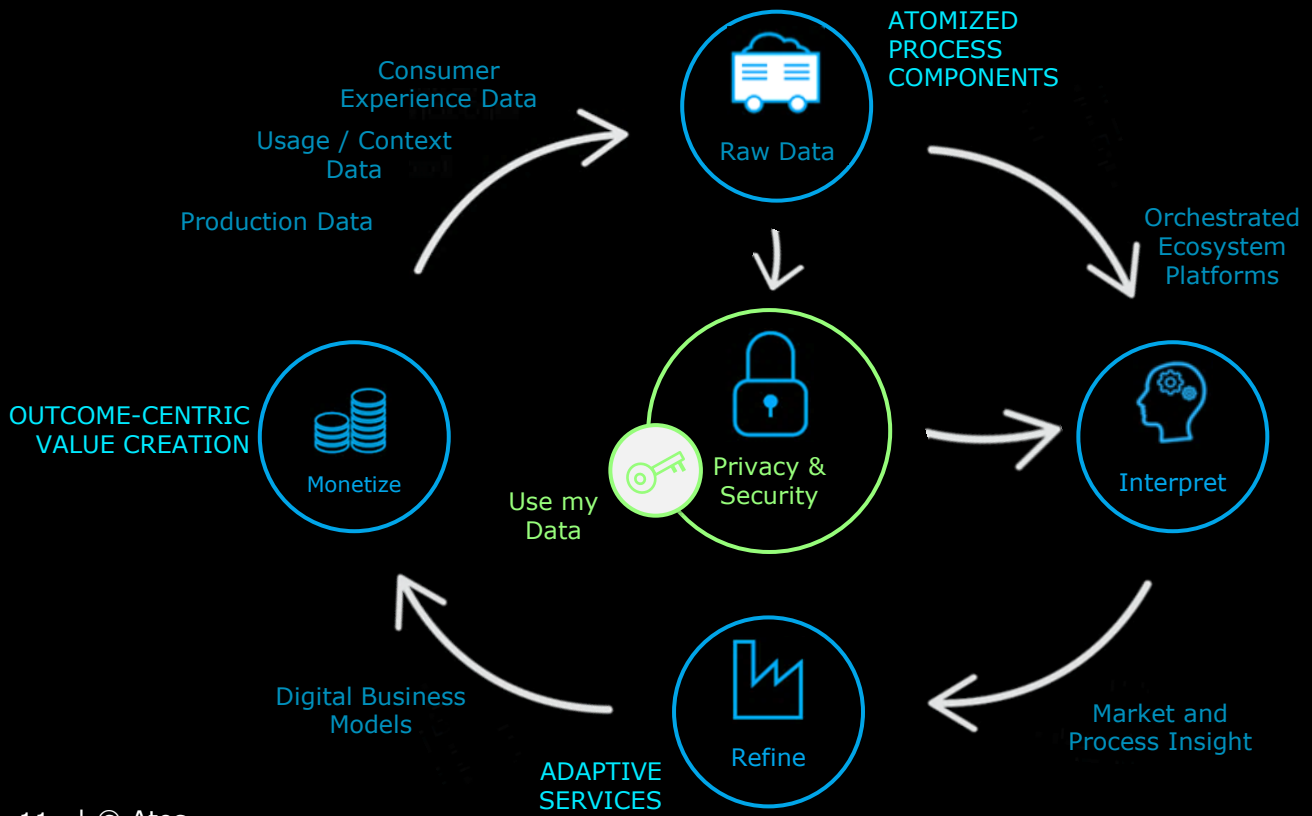
Planet Data

Data Driven Services



Value creation

THROUGH DATA-DRIVEN SMART SERVICES



6 Questions to Data Value

1. Where does your data come from?
2. Are you really capturing all of it?
3. What rights do you have to use that data - who really owns it?
4. Who else could provide the missing links for mutual benefit?
5. How do you analyse, refine and understand the massive volumes in near real time … and finally
6. How do you derive real value from that data in your business?

Defending Planet Data

4. Emerging Technologies Implications

Swarm Computing

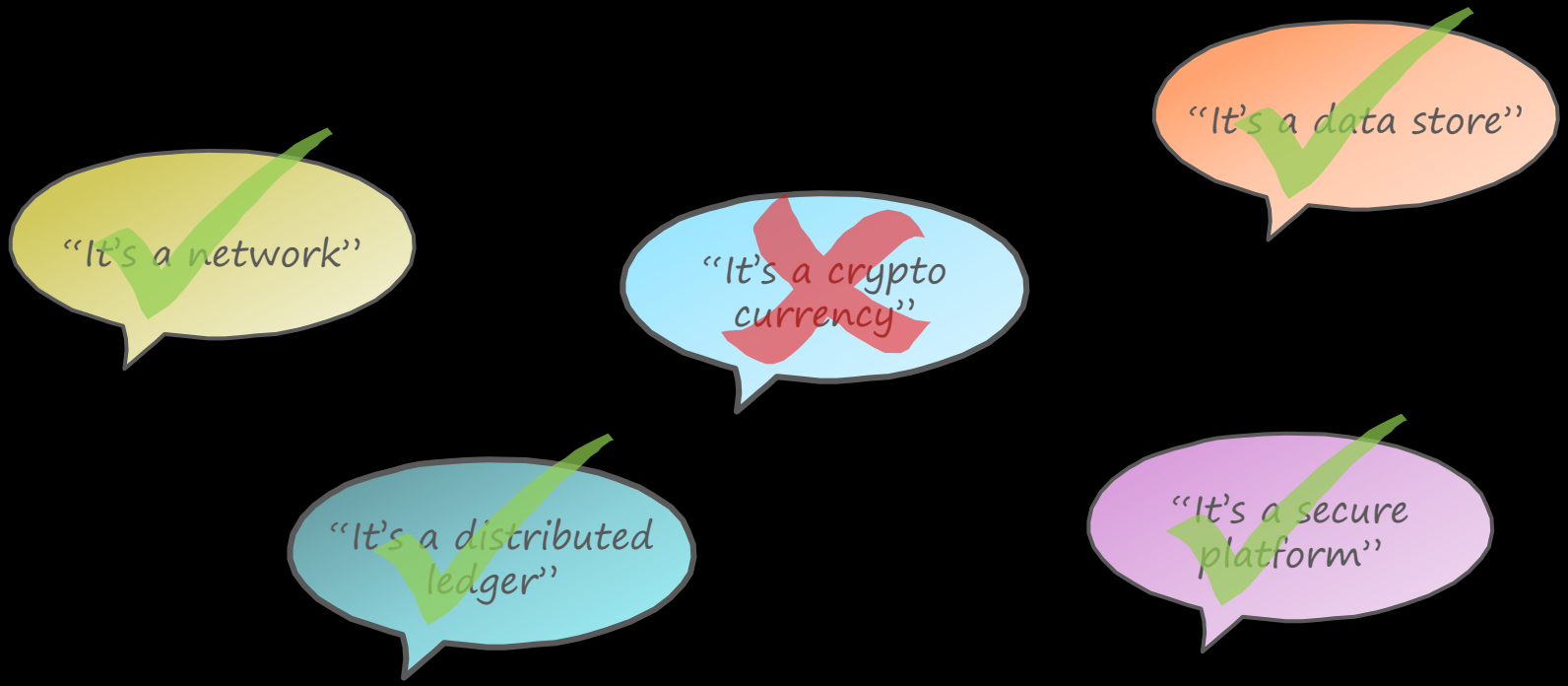
- **WHAT?**
  - A branch of Artificial Intelligence based on local algorithmic sensory interpretation and decision making
  - A set of localized agents interacting between themselves and their environments without centralized control
  - Combined local behaviour leads to global "intelligence"
- **WHY?**
  - Distributed systems with local intelligence
  - Performance optimised with redundancy
  - The combined capability > the sum of the parts
- **APPLICATIONS**
  - Remote scheduling, routing, decision making

10 Use cases for Swarm Computing

1. Automated vehicles
2. Industry 4.0
3. Smart energy
4. Smart city
5. Crowd sourced intelligence
6. Crowd behaviour prediction & management
7. Construction automation
8. Collaborative machine learning
9. Self organising enterprise
10. Self healing systems

Securing the Swarm

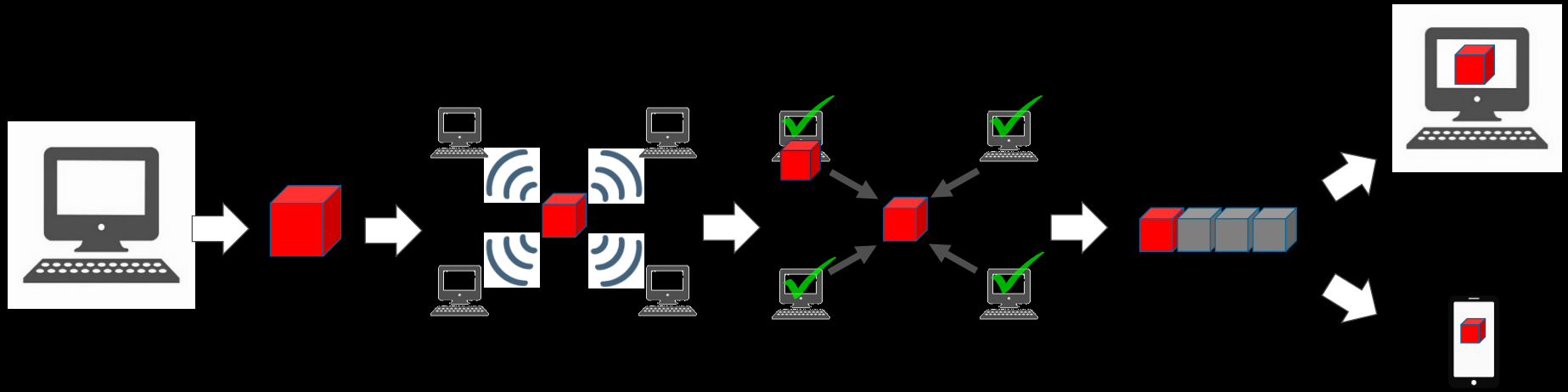
So what is Blockchain?



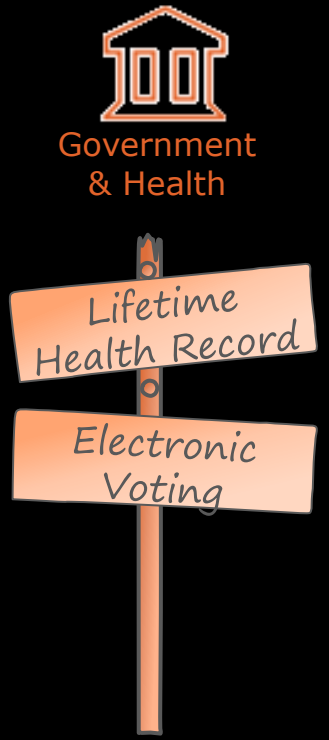
So what is Blockchain really?

- A distributed and replicated peer 3 peer ledger providing a secure 'Lifetime' data platform with a complete transactional history built in
- Security paradigm supporting a highly distributed environments
  - Traditional "keep out" security is not fit for highly connected, low latency, multi-locational systems
- Transactions are:
  - Transparent, tracked, encrypted and permanent
- Trust with no central repository of data
  - Every transaction exists in a chain of transactions from multiple sources which is self validating through a known pre and post state of every transaction
  - **Default State:** No one can see anything
  - **Concensus:** Data accessibility at a system level
  - **Consent:** Data access to a given piece of data at a given time

How Does Blockchain work?



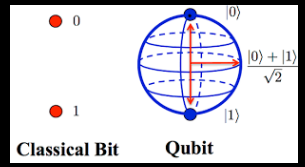
Why is Blockchain useful?



Quantum Computing

Quantum physics elevates the "simple" world of binary state computing…

- Quantum diamond computer
  - *"In the crystalline lattice of a diamond exist impurities called NV center (Nitrogen-Vacancy Center): instead of two neighboring carbon atoms, a nitrogen atom and a hole.*
  - *Nitrogen atoms have one more electron than carbon atoms that can take two spin states and play the role of qbit (controlled by electromagnetic pulses).*
  - *A center NV has at most a dozen neighboring carbon atoms and can form a cluster of qbits with the nuclear spins of these atoms. several neighboring clusters could interact via acoustic phonons carrying quantum information (remains to be demonstrated).*
- *Which means …*
  - *Where a 2-bit register in an ordinary computer can store only one of four binary configurations (00, 01, 10, or 11) at any given time, a 2-qubit register in a quantum computer can store all four numbers simultaneously, because each qubit represents two values. If more qubits are added, the increased capacity is expanded exponentially*
- *Which means …*



highest-performing quantum simulator in the world

Quantum Computing

A step change in compute power that breaks Moore's Law …

HEALTHCARE
Earlier screening for diseases and cancer detection, new treatments using molecule simulation

CLIMATOLOGY
More accurate weather forecasting, targeted interventions to address climate change

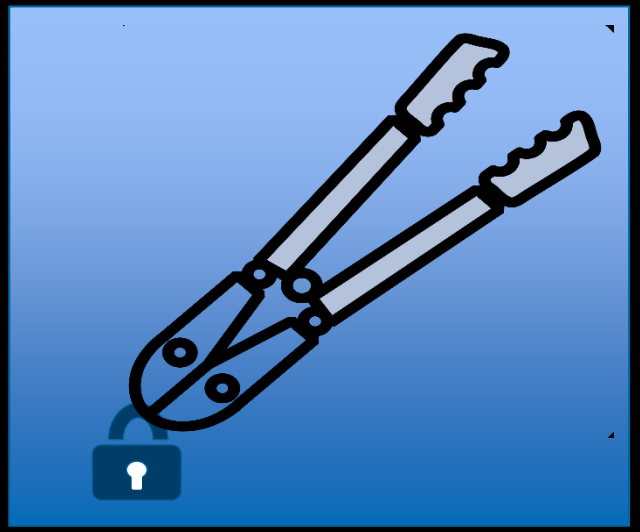
TRANSPORT MANAGEMENT
More effective real-time analysis of complex road, rail and air networks

CONSTRUCTION
Ultra-detailed readings of subsoils to aid site preparation

Quantum Cryptography

… and therefore a step change in compute power available to cyber attacks

Most encryption technologies will be ineffective against quantum-technology based attacks



5. Case Study

Digitally Transforming the Olympic Games

…what we can't say…!

Sorry!

Can you do it again? We were re-booting!

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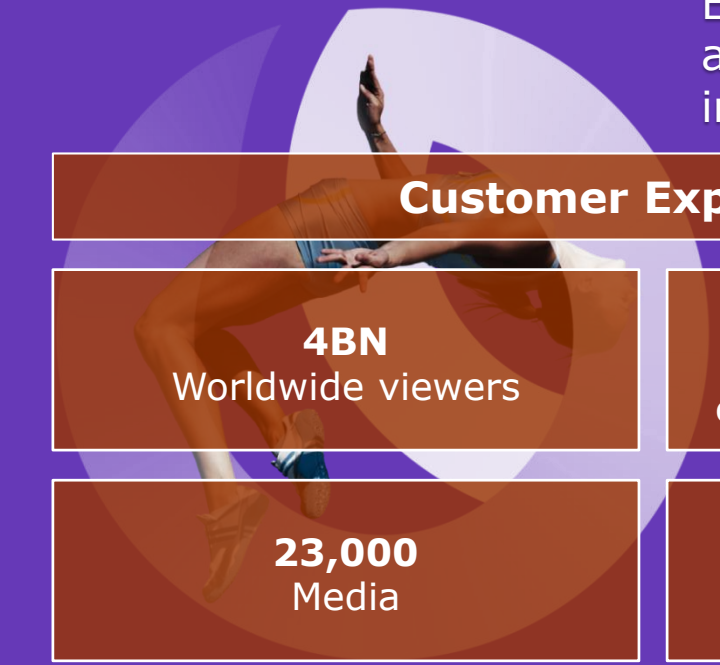
Behind the Olympic Games



Equivalent to a business of **200,000 employees,** addressing 4 billion customers, operating 24/7, in a new territory, for 4 weeks, every 2 years

Customer Experience		Trust & Compliance
4BN Worldwide viewers	**37** Competition venues with complete IT infrastructure	**300,000 +** Accreditations
23,000 Media	**10,500 +** Athletes	**0** IT security impact

Behind the Olympic Games?

Equivalent to a business of **200,000 employees,** addressing 4 billion customers, operating 24/7, in a new territory, for 4 weeks, every 2 years

Operational Excellence		Business Reinvention
50,000 Volunteers – with online portal	**200,000** Testing hours	**+++** Digital, social games
80 Different systems and applications	**250** Servers	**Cloud** Services

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The Olympic Challenges

Managing critical systems

Games Management System

Volunteer portal

Supporting PyeongChang 2018 recruit up to **16,000** volunteers (Rio 2016:50,000 volunteers)

Sport entries & qualifications

Collects and processes data for each of the **2,900** athletes eligible to compete in the Games (Rio 2016:11,303 athletes)

Accreditation

Identifies accredited participants, manages registration, assigns access privileges and provides access control information for **300,000** people

Workforce management

At work long before the Games start, support the HR departments with all functions needed for managing interviewing and training staff and volunteers

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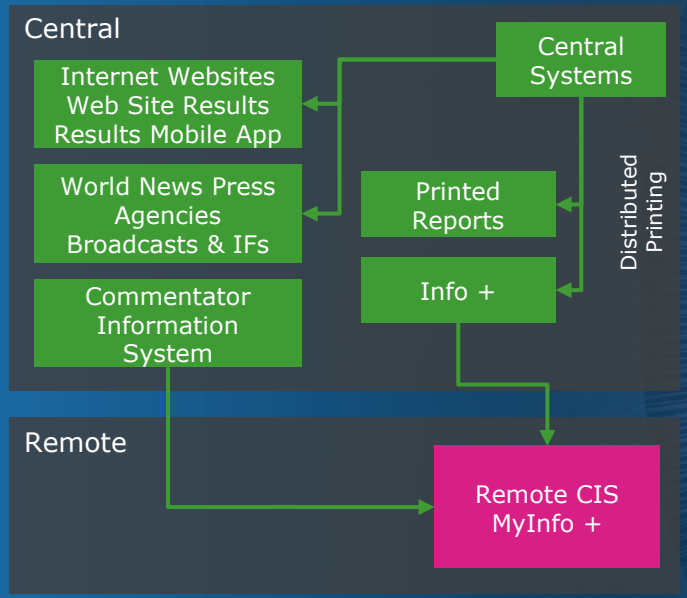
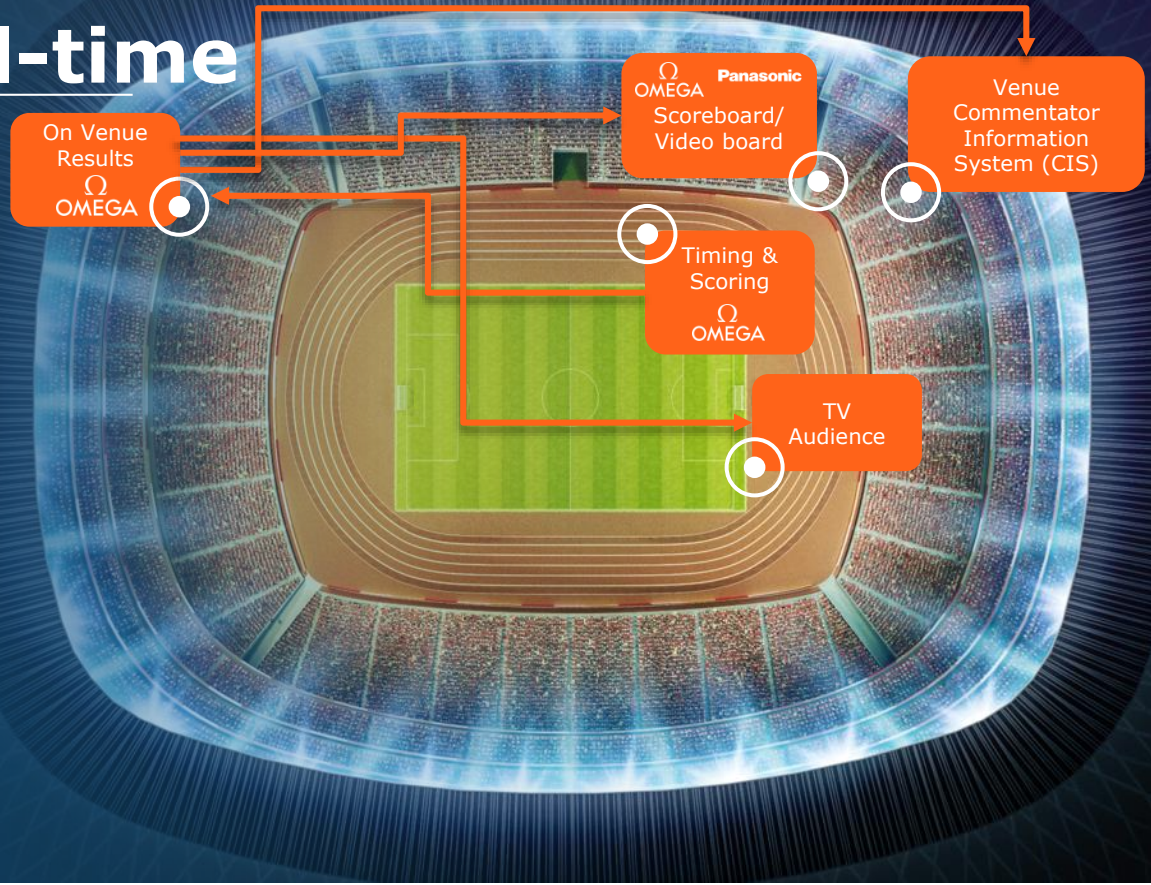
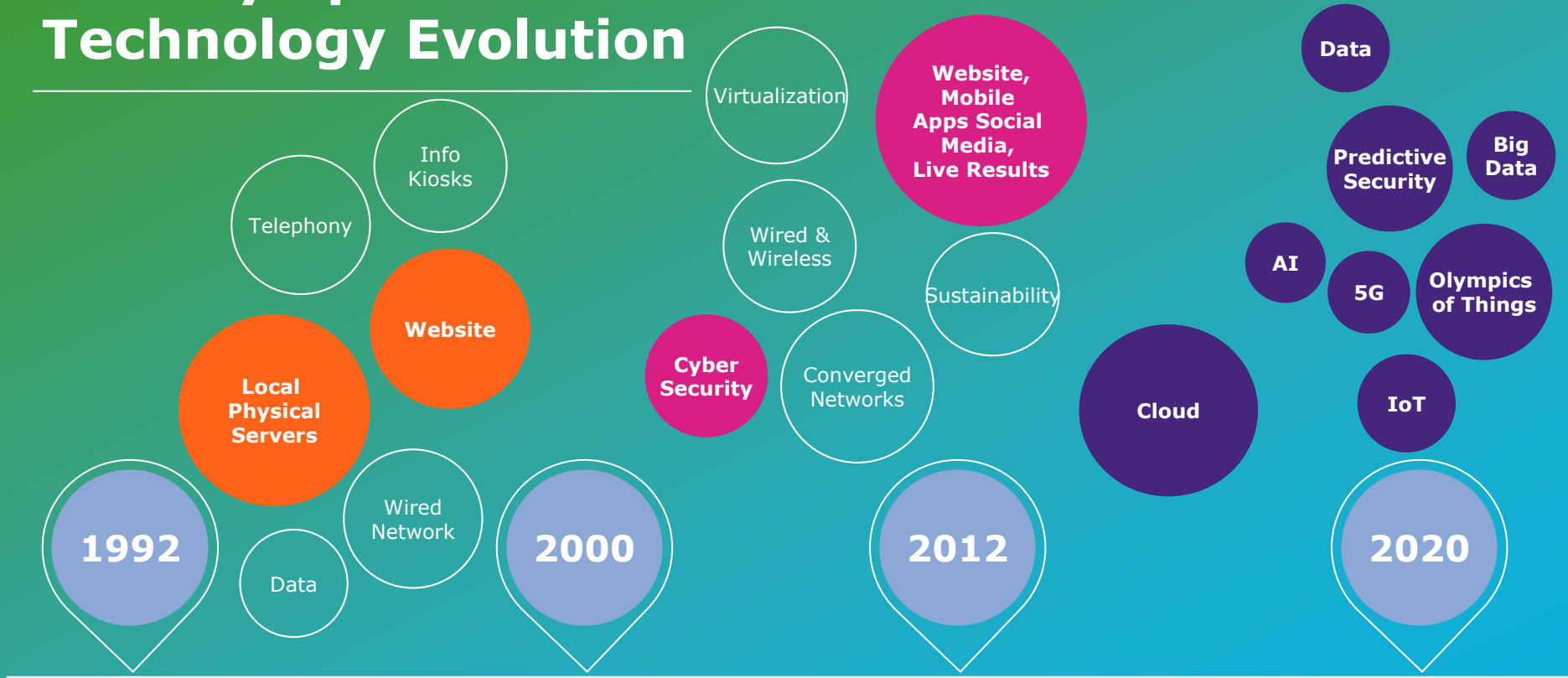
Relaying results and data to the world in real-time



OLYMPIC DIFFUSION SYSTEM



The Olympic Technology Evolution



Securing the Olympics

- Security Strategy
- Risk Management
- Collaboration with the Government (Security Advisory Board)
- Security Architecture & Implementation
- Integration of security providers
- Definition of Security Processes, Policies & Procedures
- Training
- Provisioning of tools for security services – IAM, SIEM
- Operational security services
  - SOC, Incident Response, forensics, critical situation management

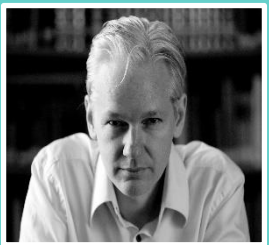
The Challenges

Data Protection Laws

Insiders

Terrorist

Abusers



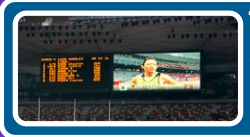
Leakages

Brand Reputation

Hackers

Employees

Strategy and Methodology



Timing and Scoring
- Real Time Applications (Scoreboard)

100% Availability
Integrity
100% Accurate

Info Distribution Systems
- Near Real Time
- Feed to Press & Broadcasters
- Remote Services

Availability
Integrity

Games Management Systems
- Olympics Resource Planning Applications
- ACR, SIS, TRA, …

Personal Data
Confidentiality
Integrity

OCOG Applications
- Non-Core Games Management Systems
- Administration Services

Availability
Integrity
Confidentiality

TOKYO 2020

Internet Facing Public Applications
- Web Sites
- Olympic Video Player

Availability
Integrity

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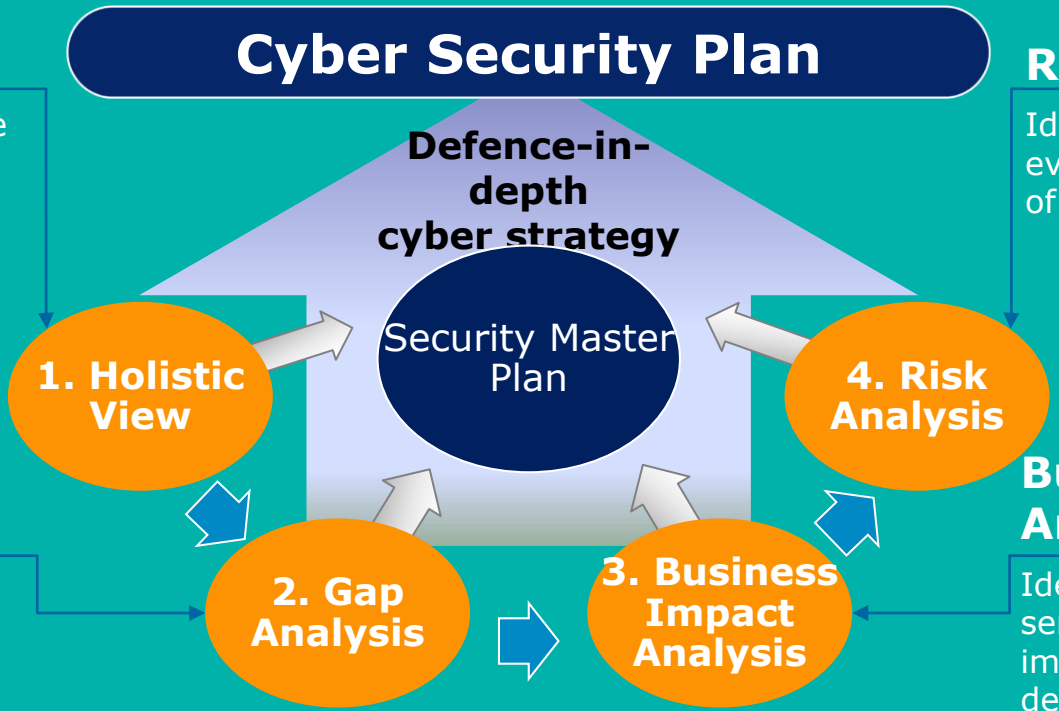
Securing IOC Organizations

Holistic view

Looking in- and outside of the controlled perimeter that may impact the services (physical, people, process, technology)



Risk analysis

Identify, analyze, evaluate and treatment of risks

Gap analysis

People, process and technology Awareness (envision for lot 4)

Maturity (process)

Based on ISO/IEC 27002:2013 & NIST

Business Impact Analysis

Identify the critical services and related impact and dependencies

Integrated approach of Intelligence-Driven Security:

Integrated Security Management

Atos Service Delivery Management (SDM)

- Governance
- Reporting
- Change Management

Atos Security Operations Center (SOC)

- Incident Management (L1/L2)
- Ticketing Management

Atos High Performance Security (AHPS) – SIEM

- IOC
- OBS
- OCS

Atos Computer Security Incidence Response Team (CSIRT)

- Incident Management (L3)
- Reactive Security Services
- Global Threat Intelligence

Atos Cyber Security Office (CSO)

- Vulnerability Monitoring
- Compliance Monitoring
- Data Leakage Prevention
- Privileged User Management
- Security Awareness

Operational Security Resources

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End-to-end Cyber-Security

Fending off

570,000,000

IT SECURITY EVENTS

0 **IMPACT ON THE GAMES**

Thank You

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